Instructions-Parts

E-Flo® DC 2–Ball Piston Pumps

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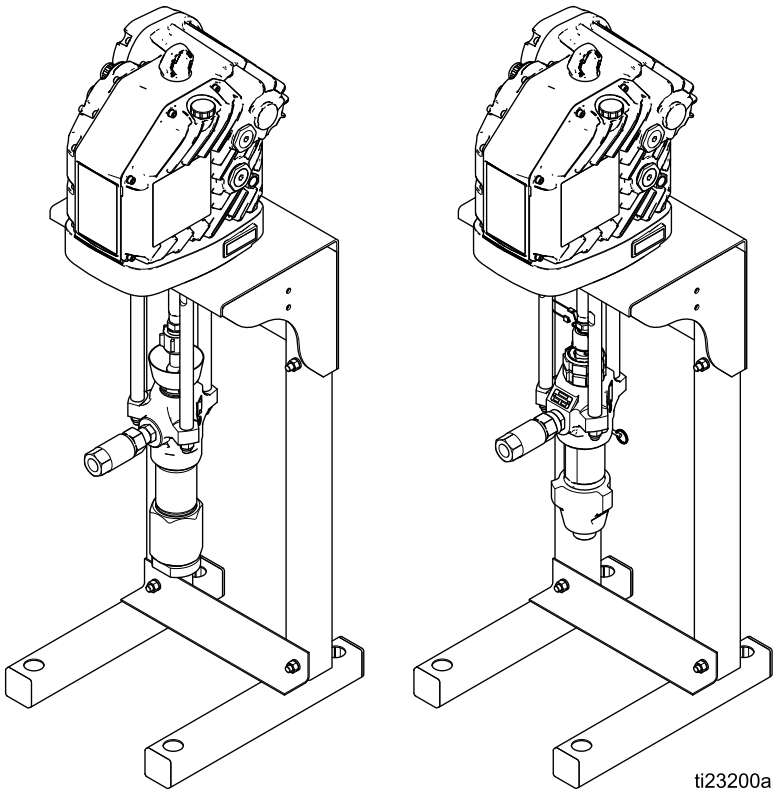
EN

Electric drive piston pumps for low to medium volume paint circulation applications.
For professional use only.

Important Safety Instructions
Read all warnings and instructions in this manual.
Save these instructions.

See Technical Data for Maximum Working Pressure.
See page 3 for model part numbers and approvals information.



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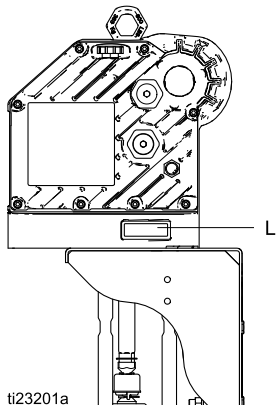
Models

The six digit part number for your equipment is printed on the equipment identification label (L). Refer to the table below for information regarding the configuration of your equipment.
See Pump Matrix, page 24, for a complete list of pump part numbers.



E-Flo DC Pump Part Number Configuration										
First and Second Digit	Third Digit		Fourth Digit			Fifth Digit			Sixth Digit	
	Digit	Lower Size	Digit	Motor Control	Approvals	Digit	Pump Material	Packings	Digit	Mounting Type
ES	7	145 CC	3	Basic	ATEX / FM / IECEx	4	Carbon Steel	3 Xtreme 2 Leather	0	None
	8	180 CC	4	Advanced	ATEX / FM / IECEx	5	Stainless Steel	4 Leather 1 PTFE	1	Stand
	9	220 CC	7	Basic	ATEX / IECEx / TIIS / KCS	6	Stainless Steel	PTFE Leather	2	Wall
	0	290 CC	8	Advanced	ATEX / IECEx / TIIS / KCS					

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NOTE: See the E-Flo DC Motor manual for motor approvals information.

Related Manuals

Manual No.	Description
3A2526	Instructions-Parts Manual, E-Flo DC Motor
3A2527	Instructions-Parts Manual, for E-Flo DC Control Module Kit
311762	Instructions-Parts Manual, Xtreme Lowers
311827	Instructions-Parts Manual, Dura-Flo Lowers

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock, Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

ELECTRIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment.
- Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

BURN HAZARD

Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.

MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.

WARNING

SKIN INJECTION HAZARD

High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**

- Engage trigger lock when not dispensing.
- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

TOXIC FLUID OR FUMES

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDSs to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

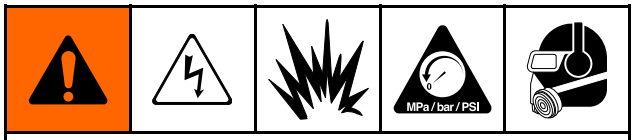
WARNING

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

Installation



Installation of this equipment involves potentially hazardous procedures. Only trained and qualified personnel who have read and who understand the information in this manual should install this equipment.

Location

When selecting the location for the equipment, keep the following in mind:

- There must be sufficient space on all sides of the equipment for installation, operator access, maintenance, and air circulation.
- Ensure that the mounting surface and mounting hardware are strong enough to support the weight of the equipment, fluid, hoses, and stress caused during operation.
- There must be a start/stop control (C) within easy reach of the equipment. See Typical Installation, page 9 .

Mount the Pump

Stand Mount

See Stand Mounting Hole Pattern, page 27

1. Select a level surface for the stand to be mounted to.
2. Secure the stand to the floor with M19 (5/8 in.) bolts. Use bolts that engage at least 152 mm (6 in.) into the floor to prevent the pump from tipping.
3. Place the pump and accessories over the bracket's mounting holes and secure with bolts (5) and washers (4) supplied.
4. Use shims to level the pump as required.

Wall Mount

See Wall Mounting Hole Pattern, page 28.

1. Select a solid position on a wall for the mounting bracket. The wall should be capable of supporting the pump and accessories that will be attached to the bracket, any additional weight of the fluid used in the pump, and any stress or strain that may be applied during pump operation.
2. Drill four 7/16 in. (11 mm) diameter holes for the mounting bolts, approximately 5 ft (1.5 m) above the floor, using the wall bracket as a template. Use any of the three mounting hole groupings
3. Bolt the bracket securely to the wall. Use bolts designed to hold in the wall's construction.
4. Place the pump and accessories over the bracket's mounting holes and secure with screws (5) and washers (4) supplied.

Power Supply Requirements

Improper wiring may cause electric shock or other serious injury if work is not performed properly. Have a qualified electrician perform any electrical work. Be sure your installation complies with all National, State and Local safety and fire codes.

The system requires a dedicated circuit protected with a circuit breaker. See table below for power supply requirements.

Table 1 . Power Supply Specifications

Model	Voltage	Phase	Hz	Current
EM0021 EM0022	200–250 Vac	1	50/60	20 A

Hazardous Area Cabling and Conduit Requirements

Explosion Proof

All electrical wiring in the hazardous area must be encased in Class I, Division I, Group D approved explosion-proof conduit. Follow all National, State, and Local electric codes.

A conduit seal (D) is required within 18 in. (457 mm) of the motor for the US and Canada. See Fig. 3.

All cables must be rated at 70°C (158°F).

Flame Proof (ATEX)

Use appropriate conduit, connectors, and cable glands rated for ATEX II 2 G. Follow all National, State, and Local electric codes.

All cable glands and cables must be rated at 70°C (158°F).

Typical Installation

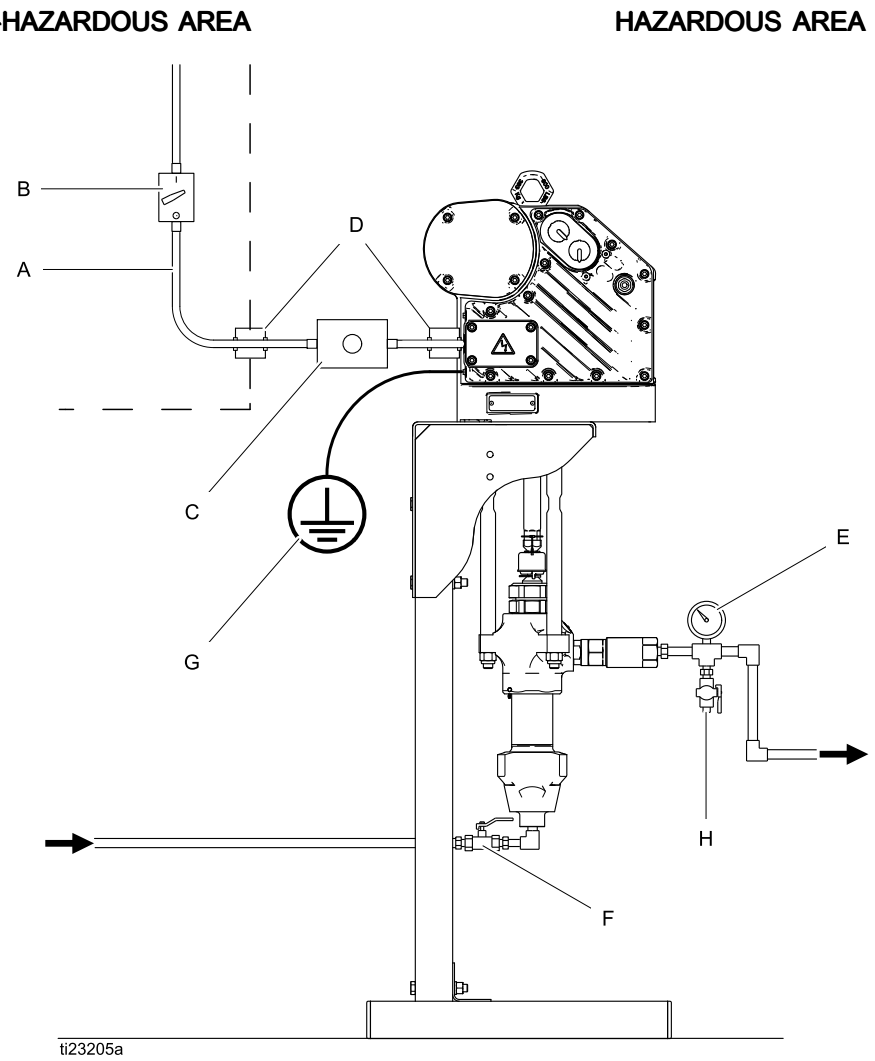


Figure 1 Typical Installation

Key for Fig. 1	
A	Electrical Supply (must be sealed conduit approved for use in hazardous locations)
B	Fused Safety Switch, with lock
C	Start/Stop Control (must be approved for use in hazardous locations)
D	Explosion Proof Conduit Seal. Required within 18 in. (457 mm) of the motor for the US and Canada.

Key for Fig. 1	
E	Fluid Pressure Gauge
F	Fluid Shutoff Valve
G	Pump Ground Wire. Two ground terminals are provided if local code requires redundant grounding connections.
H	Fluid Drain Valve

Connect the Power Supply

Improper wiring may cause electric shock or other serious injury if work is not performed properly. Have a qualified electrician perform any electrical work. Be sure your installation complies with all local codes and regulations.

1. Ensure that the fused safety switch (B, Fig 2) is shut off and locked out.

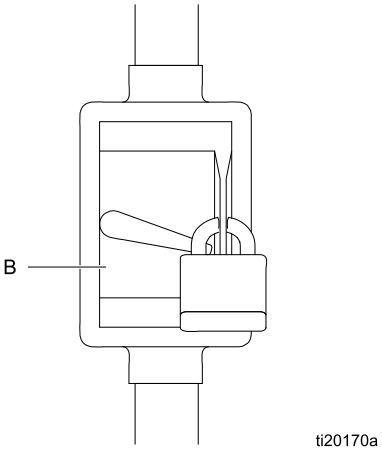


Figure 2 Locked Out Fused Safety Switch

2. See Fig. 3. Install a start/stop control (C) in the electrical supply line (A), within easy reach of the equipment. The start/stop control must be approved for use in hazardous locations.
3. Open the electrical compartment (S) on the motor.
4. Bring the power wires into the electrical compartment through the 3/4–14 npt(f) inlet port. Connect the wires to the terminals, as shown. Torque the terminal nuts to 25 in-lb (2.8 N•m) maximum. **Do not over-torque.**
5. Close the electrical compartment. Torque the cover screws to 15 ft-lb (20.3 N•m).

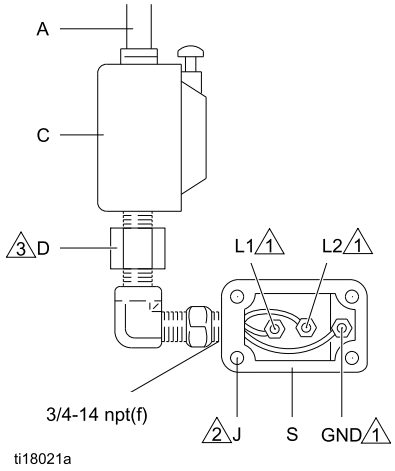
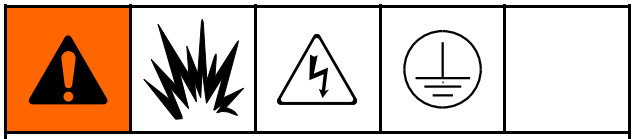


Figure 3 Connect the Power Wires

Notes for Fig. 3	
1	Tighten all terminal nuts to 25 in-lb (2.8 N•m) maximum. **Do not over-torque.**
2	Tighten cover screws to 15 ft-lb (20.3 N•m).
3	A conduit seal (D) is required within 18 in. (457 mm) of the motor for the US and Canada.

Grounding



This equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

1. **Pump:** See Fig. 4. Loosen the ground screw and attach a ground wire. Tighten the ground screw securely. Connect the other end of the ground wire to a true earth ground.

   NOTE: Advanced models require installation of the 24P822 Control Module. All pumps connected to a common control module must be grounded to the same ground point. Different ground points (unequal potential) may cause current to flow through component cables, causing incorrect signals.

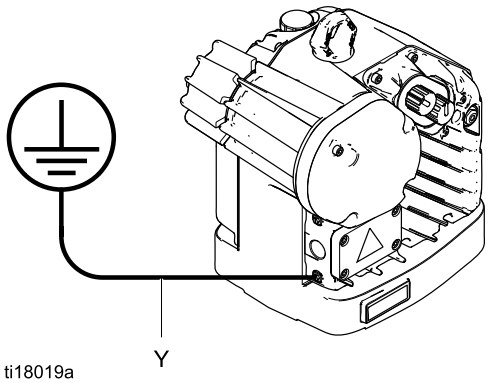


Figure 4 Ground Wire

2. **Fluid hoses:** Use only electrically conductive hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check the electrical resistance of hoses. If total resistance to ground exceeds 25 megohms, replace hose immediately
3. **Fluid supply container:** Follow your local code.

Fluid Line Accessories

Install the following accessories as shown in Fig. 1, using adapters as necessary. All fluid lines and accessories must be rated to the maximum working pressure of 400 psi (2.8 MPa, 28.0 bar).

- **Fluid drain valve (H):** required in your system, to relieve fluid pressure in the hose and circulation system.
- **Fluid pressure gauge (E):** for more precise adjustment of the fluid pressure.
- **Fluid shutoff valve (F):** shuts off fluid flow.

Fill With Oil Before Using Equipment

See Fig. 5. Before using the equipment, open the fill cap (P) and add Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil. Check the oil level in the sight glass (K). Fill until the oil level is near the halfway point of the sight glass. The oil capacity is approximately 1.5 quarts (1.4 liters). **Do not overfill.**

NOTE: Two 1 quart (0.95 liter) bottles of oil are supplied with the equipment.

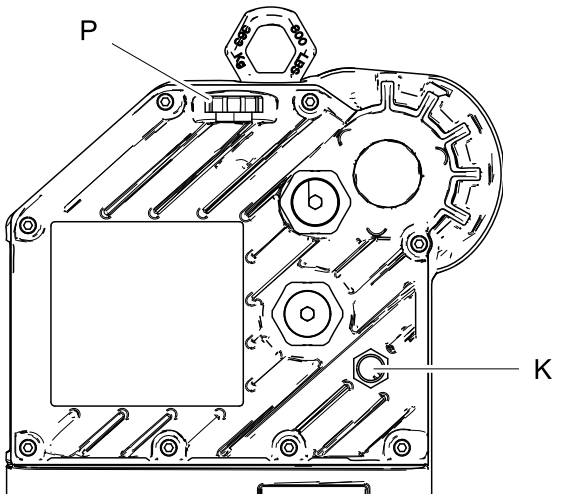


Figure 5 Sightglass and Oil Fill Cap

Flush Before Using Equipment

The pump fluid section was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment.

Control Module Accessory

The Control Module Accessory is required with Advanced E-Flo DC motors to provide the interface for users to enter selections and view information related to setup and operation. See the Control Module Accessory Kit manual for installation and operation information.

Operation

Startup

To operate the pump, follow the Startup instructions for the Basic or Advanced motor in the Motor manual. The Advanced E-Flo DC motors require installation of the 24P822 Control Module Accessory Kit to provide the interface for users to enter selections and view information related to setup and operation. See the Control Module Accessory Kit manual for installation and operation information.

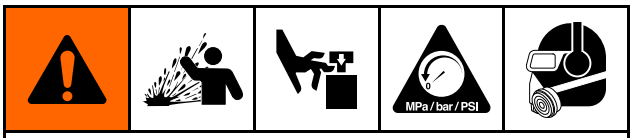
Run the pump at a slow speed until the fluid lines are primed and all air is forced out of the system.

NOTE: Xtreme pumps should not be used for waterborne paints.

Shutdown

Follow the Pressure Relief Procedure, page 13. Stop the pump at the bottom of its stroke to prevent fluid from drying on the exposed displacement rod and damaging the throat packings.

Pressure Relief Procedure



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Disengage the start/stop control (C). See Fig. 1.
2. Shut off and lock out the fused safety switch (B).
3. Open the fluid drain valve (H), having a waste container ready to catch drainage. Leave open until you are ready to pressurize system again.

Maintenance

Preventive Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

Change the Oil

NOTE: Change the oil after a break-in period of 200,000–300,000 cycles. After the break-in period, change the oil once a year.

1. See Fig. 6. Place a minimum 2 quart (1.9 liter) container under the oil drain port. Remove the oil drain plug (25). Allow all oil to drain from the motor.
2. Reinstall the oil drain plug (25). Torque to 25–30 ft-lb (34–40 N•m).
3. See Fig. 7. Open the fill cap (P) and add Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil. Check the oil level in the sight glass (K). Fill until the oil level is near the halfway point of the sight glass. The oil capacity is approximately 1.5 quarts (1.4 liters). **Do not overfill.**
4. Reinstall the fill cap.

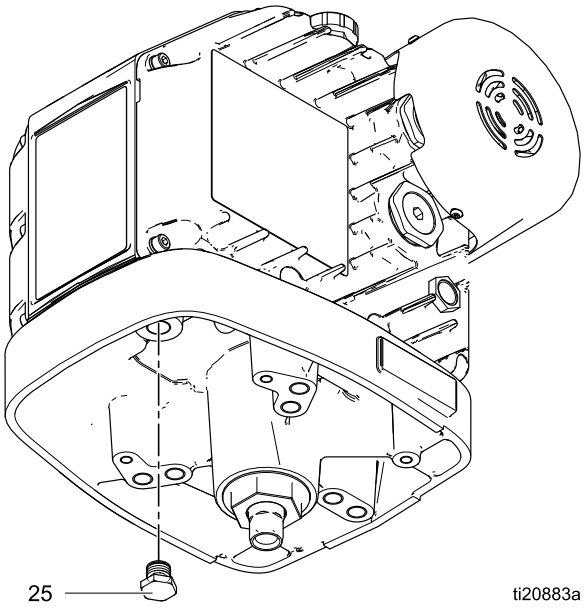


Figure 6 Oil Drain Plug

Check Oil Level

See Fig. 7. Check the oil level in the sight glass (K). The oil level should be near the halfway point of the sight glass when the unit is not running. If low, open the fill cap (P) and add Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil as required. The oil capacity is approximately 1.5 quarts (1.4 liters). **Do not overfill.**

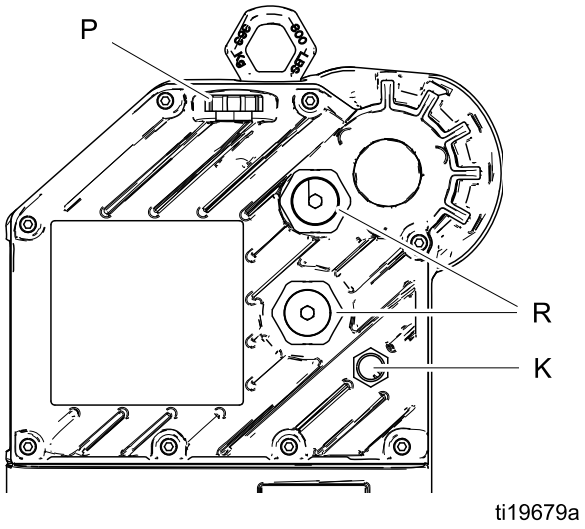


Figure 7 Sightglass and Oil Fill Cap

Bearing Pre-Load

See Fig. 7. The bearing pre-loads (R) are factory set and are not user adjustable. Do not adjust the bearing pre-loads.

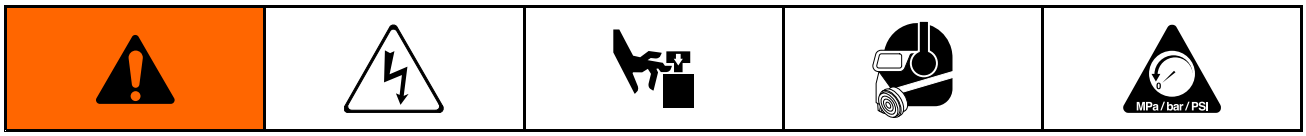
Wet-Cups

Check the wet-cup daily. Keep the wet-cup 1/3 filled with Graco Throat Seal Liquid (TSL™) or compatible solvent.

Flushing

- Flush before changing fluids, before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment.
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

Troubleshooting



NOTE: Check all possible remedies before disassembling the pump.

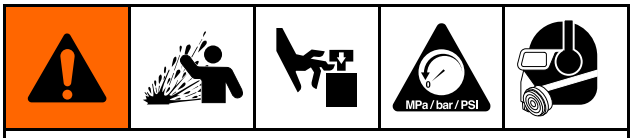
NOTE: The LED on the motor will blink if an error is detected. See **Error Code Troubleshooting** in the motor manual for further information.

Problem	Cause	Solution
Pump output low on both strokes.	Inadequate power supply.	See Power Supply Requirements, page 7 .
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Worn piston packing.	Replace. See lower manual.
Pump output low on only one stroke.	Held open or worn ball check valves.	Check and repair. See lower manual.
	Worn piston packing.	Replace. See lower manual.
No output.	Improperly installed ball check valves.	Check and repair. See lower manual.
Pump operates erratically.	Exhausted fluid supply.	Refill and reprime pump.
	Held open or worn ball check valves.	Check and repair. See lower manual.
	Worn piston packing.	Replace. See lower manual.
Pump will not operate.	Inadequate power supply.	See Power Supply Requirements, page 7 .
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Fluid dried on piston rod.	Disassemble and clean pump. See lower manual. In future, stop pump at bottom of stroke.

Repair

Dura-Flo Lowers

Disassembly



To avoid crushing injuries or muscle strains, use caution when disconnecting the lower, it can weigh up to 25 kg (55 lbs).

1. Stop the pump at the bottom of its stroke.
2. Relieve the pressure. See the Pressure Relief Procedure, page 13.
3. Disconnect the hoses from the lower and plug the ends to prevent fluid contamination.
4. Loosen the coupling nut (11) and remove the collars (10). See Fig. 8.
5. Remove the coupling nut from the piston rod (R).
6. Unscrew the locknuts (8) from the tie rods (6).
7. Separate the motor (3) and lower (7).

To repair the lower, see the Dura-Flo Lower instruction manual 311827. There are no user-serviceable parts in the motor. Contact your Graco representative for assistance.

Reassembly

NOTE: If the coupling adapter (9) and tie rods (6) have been disassembled from the motor (3), see Reassemble the Coupling Adapter and Tie Rods to the Motor, page 19

1. Assemble the coupling nut (11) to the piston rod (R). See Fig. 8.
2. Orient the lower (7) to the motor (3). Position the lower (7) on the tie rods (6). Lubricate the threads of the tie rods (6).
3. Screw the tie rod locknuts (8) onto the tie rods (6). Tighten the locknuts (8) and torque to 50-60 ft-lb (68-81 N•m).
4. Insert the collars (10) into the coupling nut (11). Tighten the coupling nut (11) onto the coupling adapter (9) and torque to 90–100 ft-lb (122–135 N•m).
5. Flush and test the pump before reinstalling it in the system. Connect hoses and flush the pump. While it is pressurized, check for smooth operation and leaks. Adjust or repair as necessary before reinstalling in the system. Reconnect the pump ground wire before operating.

NOTE: When used with E-Flo DC motors, Dura-Flo lowers require check valve (35) to be installed.

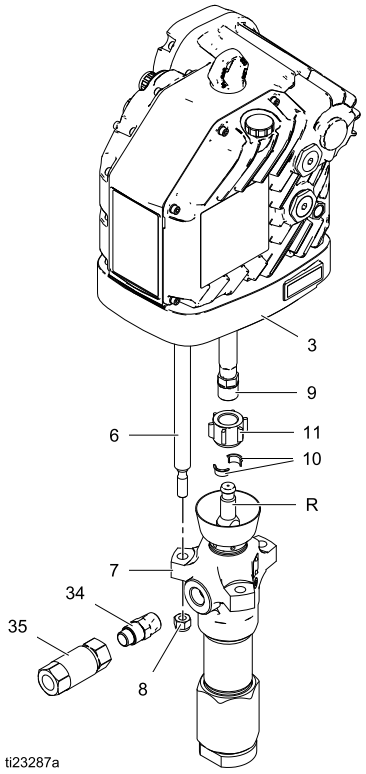
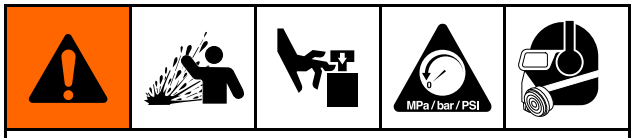


Figure 8 Dura-Flo Pump Assembly

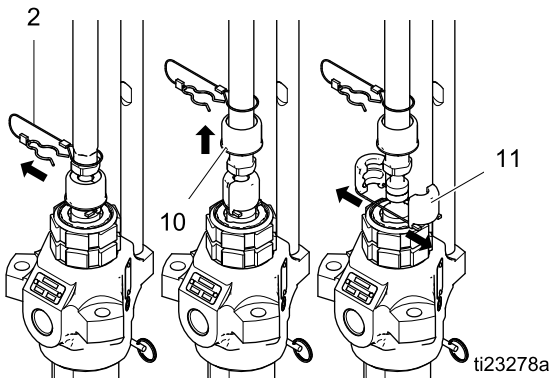
Xtreme Lowers

Disassembly

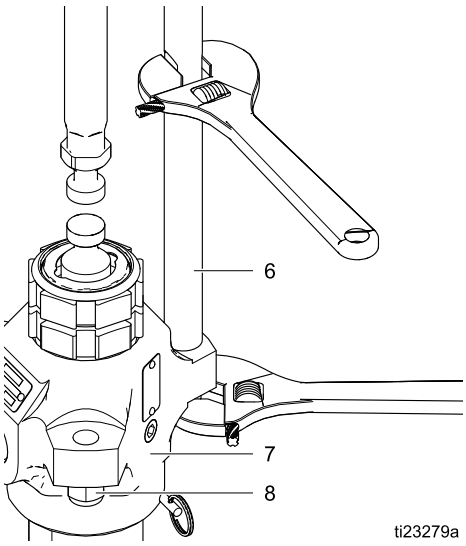


To avoid crushing injuries or muscle strains, use caution when disconnecting the lower, it can weigh up to 25 kg (55 lbs).

1. Stop the pump at the bottom of its stroke.
2. Relieve the pressure. See the Pressure Relief Procedure, page 13.
3. Disconnect the hoses from the lower and plug the ends to prevent fluid contamination.
4. Remove clip (2) and slide coupling cover (10) up to remove the coupling (11).



5. Unscrew the nuts (8) and remove the lower (7). Use a wrench to hold the tie rod flats to keep the rods from turning.



To repair the lower, see the Xtreme Lower instruction manual 311762. There are no user-serviceable parts in the motor. Contact your Graco representative for assistance.

Reassembly

NOTE: If the coupling adapter (9) and tie rods (6) have been disassembled from the motor (3), see Reassemble the Coupling Adapter and Tie Rods to the Motor, page 19

1. Orient the lower (7) to the motor (3). Position the lower (7) on the tie rods (6). Lubricate the threads of the tie rods (6).
2. Screw the tie rod locknuts (8) onto the tie rods (6). Tighten the locknuts (8) and torque to 50-60 ft-lb (68-81 N•m).
3. Raise the motor shaft. Place the coupling cover (10) onto the coupling adapter (9) and lower the motor shaft. Place the coupling (11) onto the lower (7) and slide the coupling cover (10) over the coupling (11). Insert clip (2).
4. Flush and test the pump before reinstalling it in the system. Connect hoses and flush the pump. While it is pressurized, check for smooth operation and leaks. Adjust or repair as necessary before reinstalling in the system. Reconnect the pump ground wire before operating.

NOTE: When used with E-Flo DC motors, Xtreme lowers require check valve (33) to be installed.

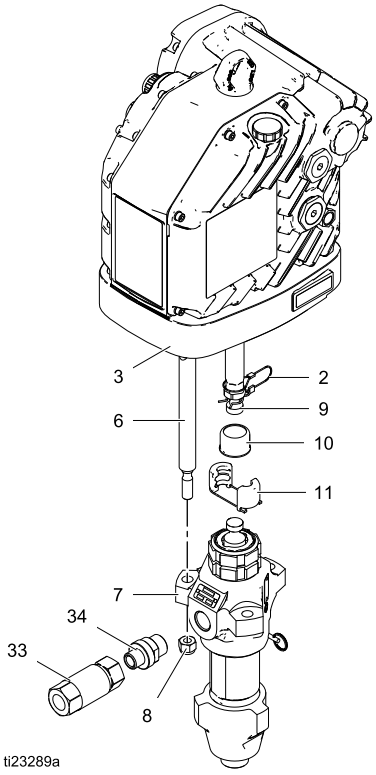


Figure 9 Xtreme Pump Assembly

Reassemble the Coupling Adapter and Tie Rods to the Motor

NOTE: Use this procedure only if the coupling adapter (9) and tie rods (6) have been disassembled from the motor (3), to ensure proper alignment of the motor shaft to the piston rod (R).

1. See Fig. 10. Screw the tie rods (6) into the motor (3) and torque to 50-60 ft-lb (68-81 N•m).
2. Screw the coupling adapter (9) into the motor shaft and torque to 90–100 ft-lb (122–135 N•m).
3. Reassemble the pump to the motor. Use the applicable instructions for your pump; Dura-Flo, page 16 or Xtreme, page 18.

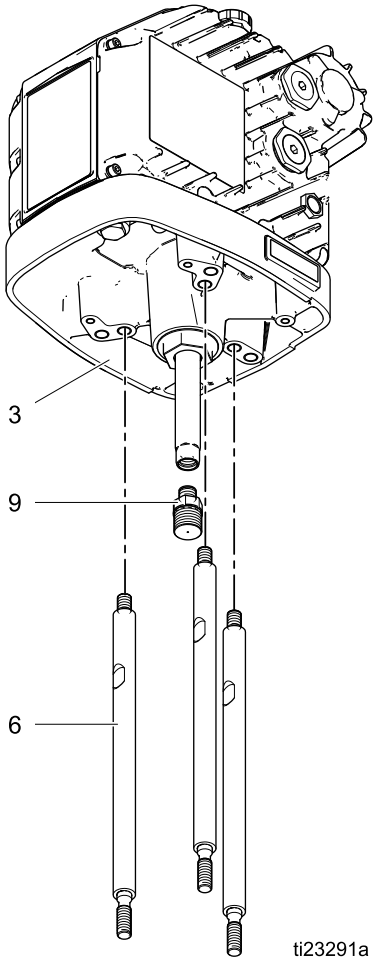
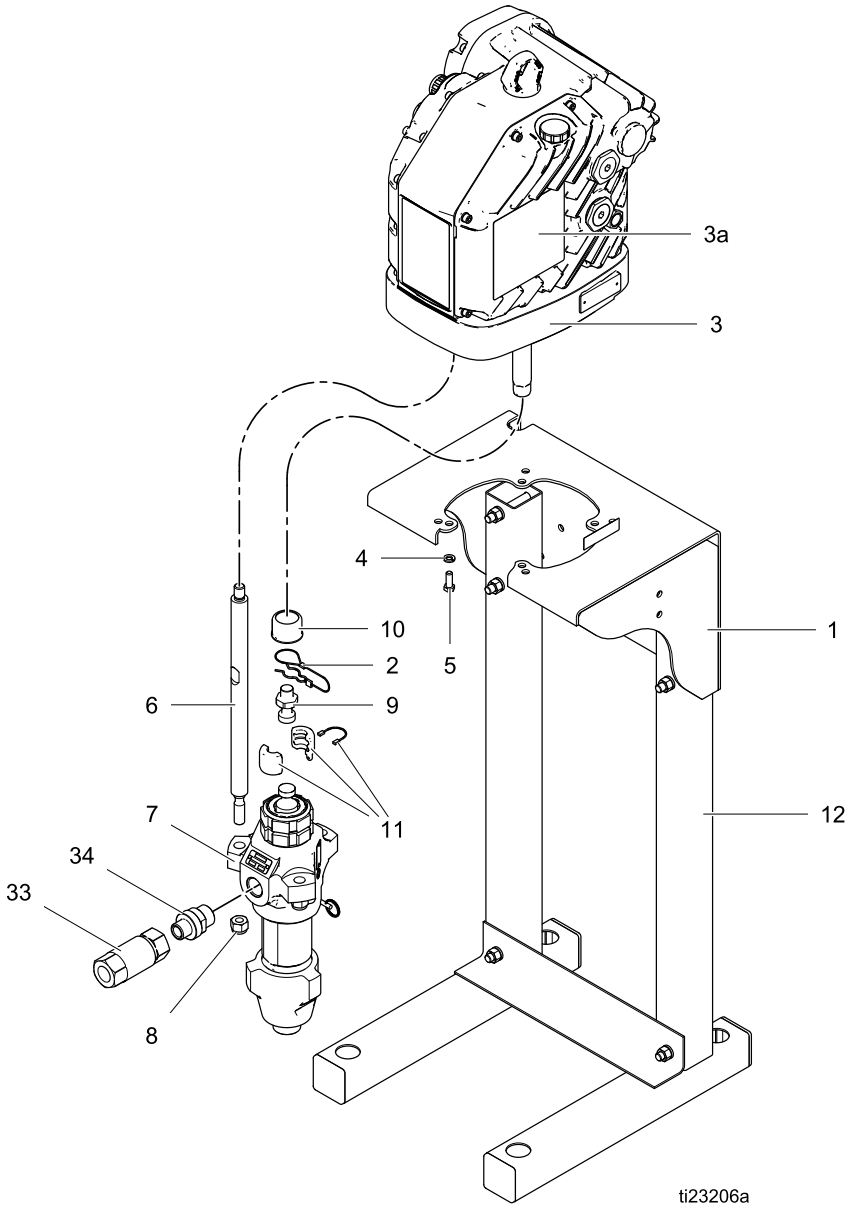


Figure 10 Pump Assembly

Parts

Xtreme Pump Assembly

See Models, page 3 for an explanation of the pump part number.

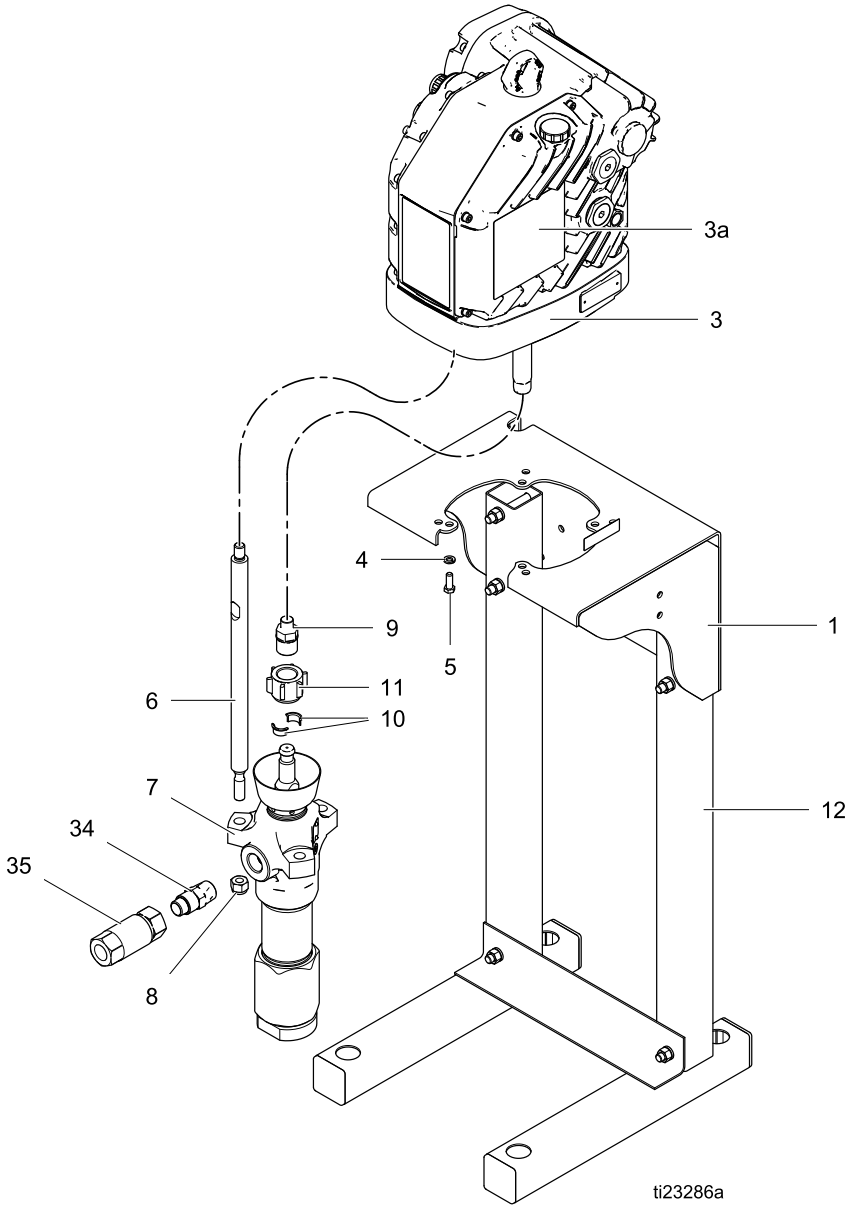


Ref	Part	Description	Qty
1	See Pump Matrix, page 24	KIT, mounting bracket, pump; includes items 4 and 5; see manual 311619	1
2	244820	CLIP, hairpin	1
3	See Pump Matrix, page 24	MOTOR, Basic; see motor manual; includes items 3a and 3b	1
3a▲	16M130	LABEL, warning	1
3b	16W645	OIL, gear, synthetic; ISO 220 silicone-free; 1 quart (0.95 liter); not shown	2
4	See Pump Matrix, page 24	WASHER	4
5	See Pump Matrix, page 24	BOLT	4
6	15F837	ROD, tie	3
7	See Pump Matrix, page 24	PUMP, displacement; see lower manual	1
8	107112	NUT, lock, hex	3
9	15H392	ADAPTER	1
10	197340	COLLAR, coupling	2
11	244819	NUT, coupling	1
12	See Pump Matrix, page 24	STAND, floor	1
33	16T480	VALVE, check	1
34	See Pump Matrix, page 24	FITTING	1

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

Dura-Flo Pump Assembly

See Models, page 3 for an explanation of the pump part number.



Ref	Part	Description	Qty
1	See Pump Matrix, page 24	KIT, mounting bracket, pump; includes items 4 and 5; see manual 311619	1
3	See Pump Matrix, page 24	MOTOR; Basic or Advanced; see motor manual; includes items 3a and 3b	1
3a▲	16M130	LABEL, warning	1
3b	16W645	OIL, gear, synthetic; ISO 220 silicone-free; 1 quart (0.95 liter); not shown	2
4	See Pump Matrix, page 24	WASHER	4
5	See Pump Matrix, page 24	BOLT	4
6	15H562	ROD, tie	3
7	See Pump Matrix, page 24	PUMP, displacement; see lower manual	1
8	101712	NUT, lock	3
9	15H370	ADAPTER	1
10	184129	COLLAR, coupling	2
11	186925	NUT, coupling	1
12	See Pump Matrix, page 24	STAND, floor	1
34	See Pump Matrix, page 24	FITTING	1
35	24S039	VALVE, check	1

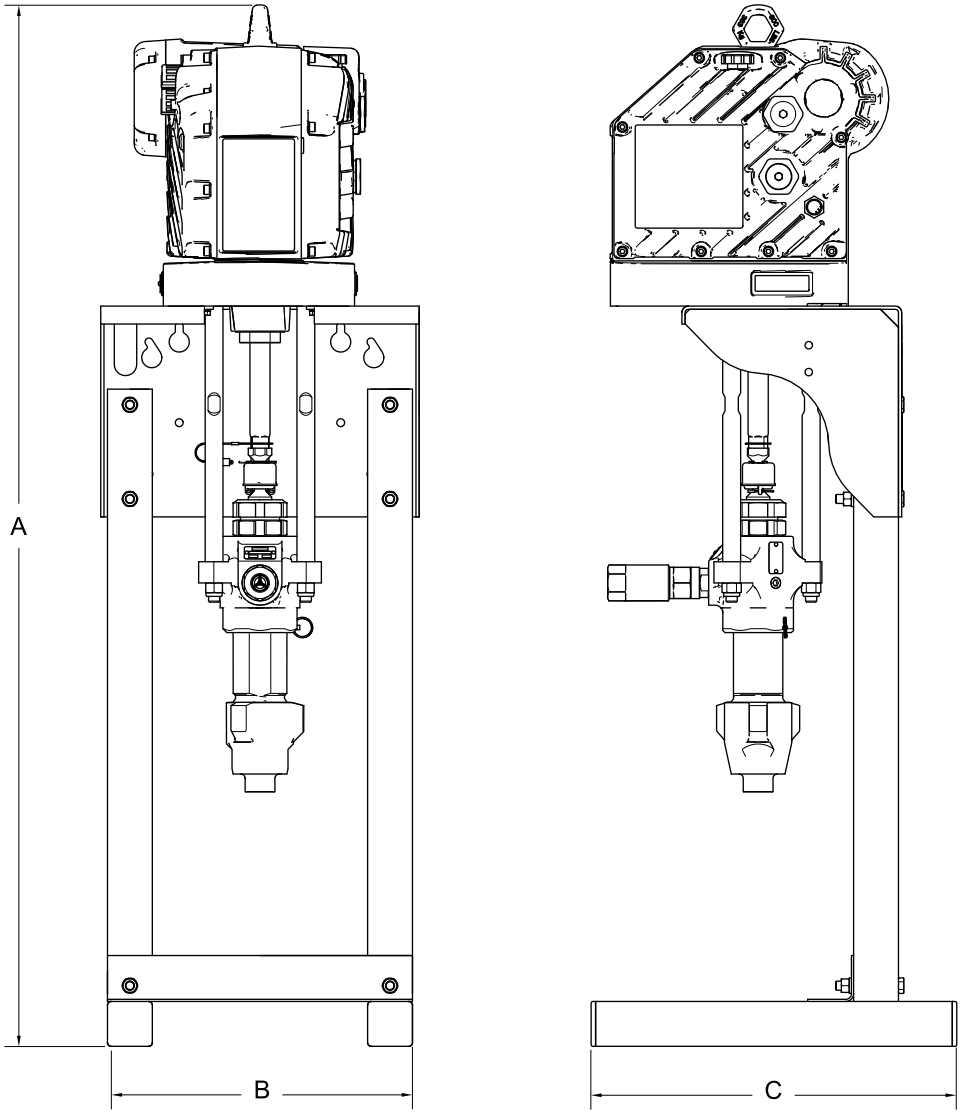
▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

Pump Matrix

Pump Part No.	Pump Series	Mounting Bracket (Ref 1)	Floor Stand (Ref 12)	Motor (Ref 3)	Washer (Ref 4)	Bolt (Ref 5)	Lower Pump (Ref 7)	Fitting (Ref 34)
ES0340	A			EM0021			L29AC1	15C257
ES0341	A	255143	256193	EM0021	100133	100101	L29AC1	15C257
ES0342	A	255143		EM0021	100133	100101	L29AC1	15C257
ES9340	A			EM0021			L22AC1	15C257
ES9341	A	255143	256193	EM0021	100133	100101	L22AC1	15C257
ES9342	A	255143		EM0021	100133	100101	L22AC1	15C257
ES8340	A			EM0021			L18AC1	175013
ES8341	A	255143	256193	EM0021	100133	100101	L18AC1	175013
ES8342	A	255143		EM0021	100133	100101	L18AC1	175013
ES0350	A			EM0021			247192	16C946
ES0351	A	255143	256193	EM0021	100133	100101	247192	16C946
ES0352	A	255143		EM0021	100133	100101	247192	16C946
ES0450	A			EM0022			247192	16C946
ES0451	A	255143	256193	EM0022	100133	100101	247192	16C946
ES0452	A	255143		EM0022	100133	100101	247192	16C946
ES9350	A			EM0021			247190	16C946
ES9351	A	255143	256193	EM0021	100133	100101	247190	16C946
ES9352	A	255143		EM0021	100133	100101	247190	16C946
ES9450	A			EM0022			247190	16C946
ES9451	A	255143	256193	EM0022	100133	100101	247190	16C946
ES9452	A	255143		EM0022	100133	100101	247190	16C946
ES8350	A			EM0021			261657	190724
ES8351	A	255143	256193	EM0021	100133	100101	261657	190724
ES8352	A	255143		EM0021	100133	100101	261657	190724
ES8450	A			EM0022			261657	190724
ES8451	A	255143	256193	EM0022	100133	100101	261657	190724
ES8452	A	255143		EM0022	100133	100101	261657	190724
ES7360	A			EM0021			247168	190724
ES7361	A	255143	256193	EM0021	100133	100101	247168	190724
ES7362	A	255143		EM0021	100133	100101	247168	190724
ES7460	A			EM0022			247168	190724
ES7461	A	255143	256193	EM0022	100133	100101	247168	190724
ES7462	A	255143		EM0022	100133	100101	247168	190724

Pump Part No.	Pump Series	Mounting Bracket (Ref 1)	Floor Stand (Ref 12)	Motor (Ref 3)	Washer (Ref 4)	Bolt (Ref 5)	Lower Pump (Ref 7)	Fitting (Ref 34)
ES0740	A			EM0023			L29AC1	15C257
ES0741	A	255143	256193	EM0023	100133	100101	L29AC1	15C257
ES0742	A	255143		EM0023	100133	100101	L29AC1	15C257
ES9740	A			EM0023			L22AC1	15C257
ES9741	A	255143	256193	EM0023	100133	100101	L22AC1	15C257
ES9742	A	255143		EM0023	100133	100101	L22AC1	15C257
ES8740	A			EM0023			L18AC1	175013
ES8741	A	255143	256193	EM0023	100133	100101	L18AC1	175013
ES8742	A	255143		EM0023	100133	100101	L18AC1	175013
ES0750	A			EM0023			247192	16C946
ES0751	A	255143	256193	EM0023	100133	100101	247192	16C946
ES0752	A	255143		EM0023	100133	100101	247192	16C946
ES0850	A			EM0024			247192	16C946
ES0851	A	255143	256193	EM0024	100133	100101	247192	16C946
ES0852	A	255143		EM0024	100133	100101	247192	16C946
ES9750	A			EM0023			247190	16C946
ES9751	A	255143	256193	EM0023	100133	100101	247190	16C946
ES9752	A	255143		EM0023	100133	100101	247190	16C946
ES9850	A			EM0024			247190	16C946
ES9851	A	255143	256193	EM0024	100133	100101	247190	16C946
ES9852	A	255143		EM0024	100133	100101	247190	16C946
ES8750	A			EM0023			261657	190724
ES8751	A	255143	256193	EM0023	100133	100101	261657	190724
ES8752	A	255143		EM0023	100133	100101	261657	190724
ES8850	A			EM0024			261657	190724
ES8851	A	255143	256193	EM0024	100133	100101	261657	190724
ES8852	A	255143		EM0024	100133	100101	261657	190724
ES7760	A			EM0023			247168	190724
ES7761	A	255143	256193	EM0023	100133	100101	247168	190724
ES7762	A	255143		EM0023	100133	100101	247168	190724
ES7860	A			EM0024			247168	190724
ES7861	A	255143	256193	EM0024	100133	100101	247168	190724
ES7862	A	255143		EM0024	100133	100101	247168	190724

Dimensions

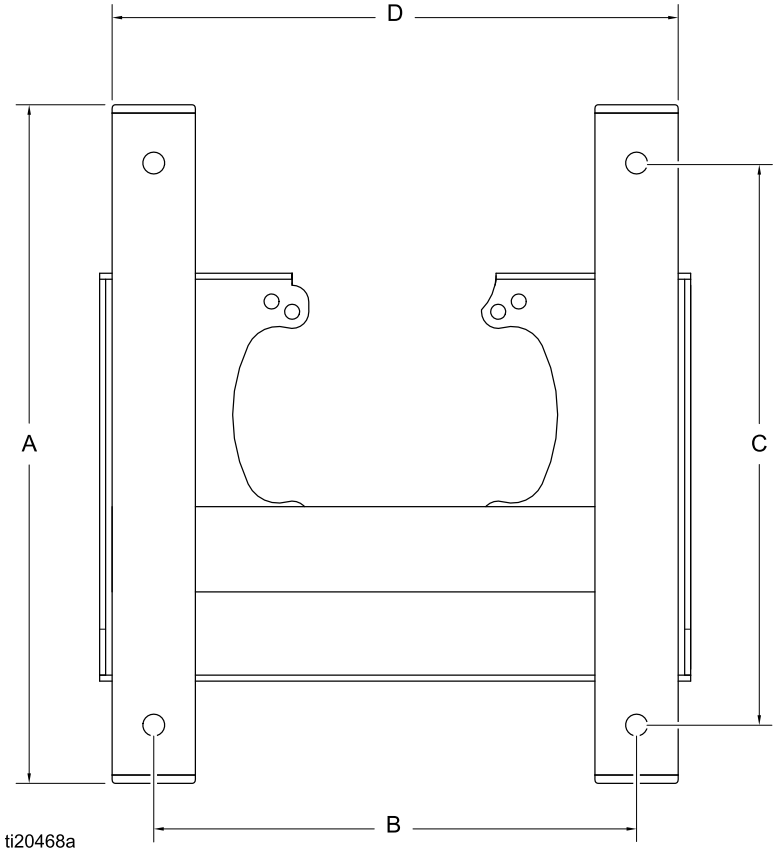


ti23207a

A	B	C
58.00 in. (1473 mm)	17.00 in. (432 mm)	19.88 in. (505 mm)

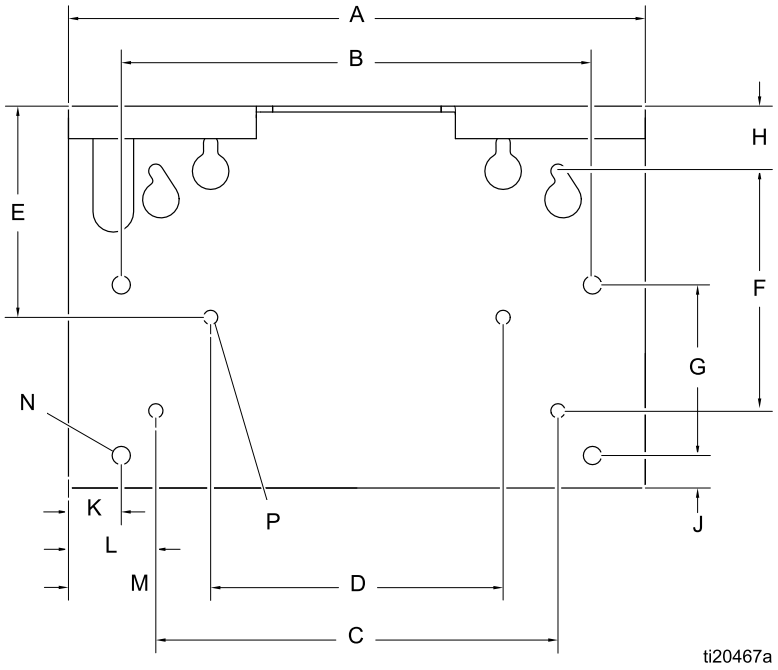
Mounting Hole Patterns

Stand Mount



Dimension	Measurement
A	19.88 in. (505 mm)
B	14.50 in. (368 mm)
C	16.88 in. (429 mm)
D	17.00 in. (432 mm)

Wall Mount



Dimension	Measurement
A	17.8 in. (451 mm)
B	14.5 in. (368 mm)
C	12.4 in. (314 mm)
D	9.0 in. (229 mm)
E	5.4 in. (137 mm)
F	7.4 in. (187 mm)
G	5.3 in. (133 mm)
H	2.0 in. (51 mm)
J	1.0 in. (25 mm)
K	1.6 in. (41 mm)
L	2.7 in. (69 mm)
M	4.4 in. (112 mm)
N	Four 0.562 in. (14 mm) diameter holes for mounting to stand
P	Four 0.438 in. (11 mm) diameter holes for mounting to wall

Performance Charts

To find the fluid pressure (psi/bar/MPa) at a specific fluid flow (gpm/lpm) and percentage of maximum force:

1. Locate the desired fluid flow in the scale at the bottom of the chart.
2. Follow the vertical line up to the intersection with the selected percentage of maximum force (see the **Key** below).
3. Follow left to the vertical scale to read the fluid outlet pressure.

Key to Performance Charts

NOTE: The charts show the motor operating at 100%, 70%, and 40% of maximum force. These values are approximately equivalent to an air motor operating at 100, 70, and 40 psi.

	Pressure
Max Pressure	—Ⓐ—
70% Pressure	—Ⓑ—
40% Pressure	—Ⓒ—

	Motor Amps/Watts
Max Pressure	– –Ⓐ– –
70% Pressure	– –Ⓑ– –
40% Pressure	– –Ⓒ– –

Table 2 . E-Flo DC with Dura-Flo 145 Lower

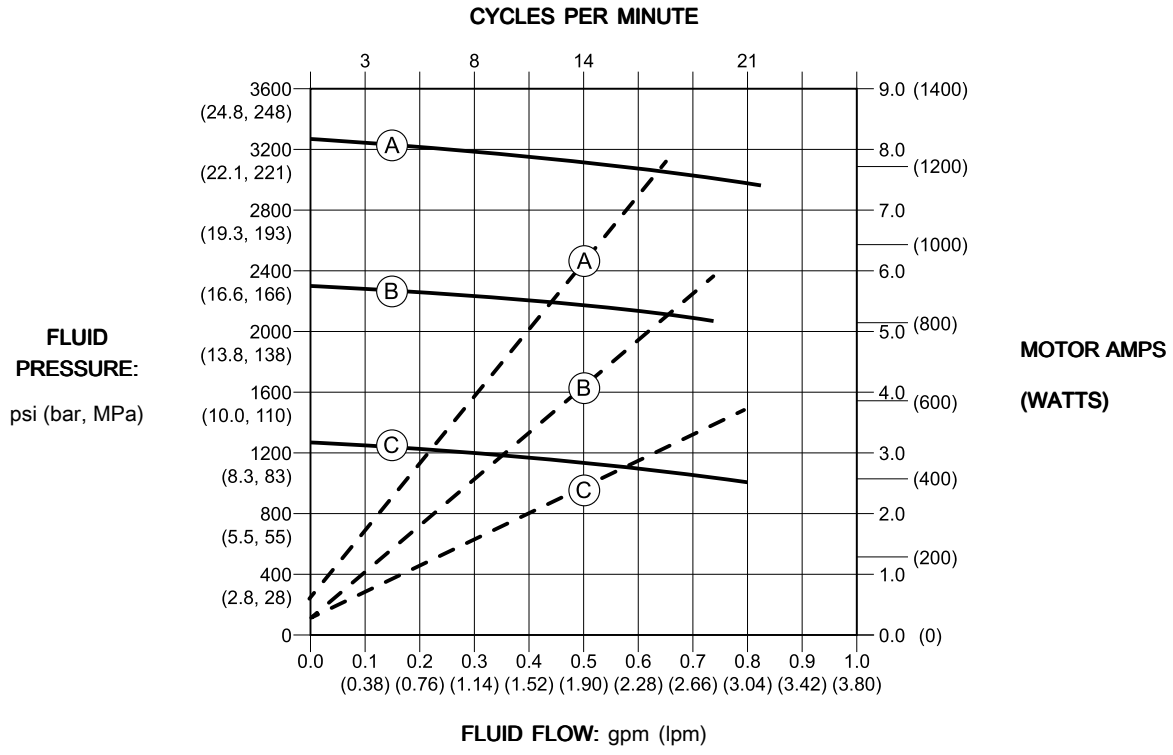


Table 3 . E-Flo DC with Dura-Flo/Xtreme 180 Lower

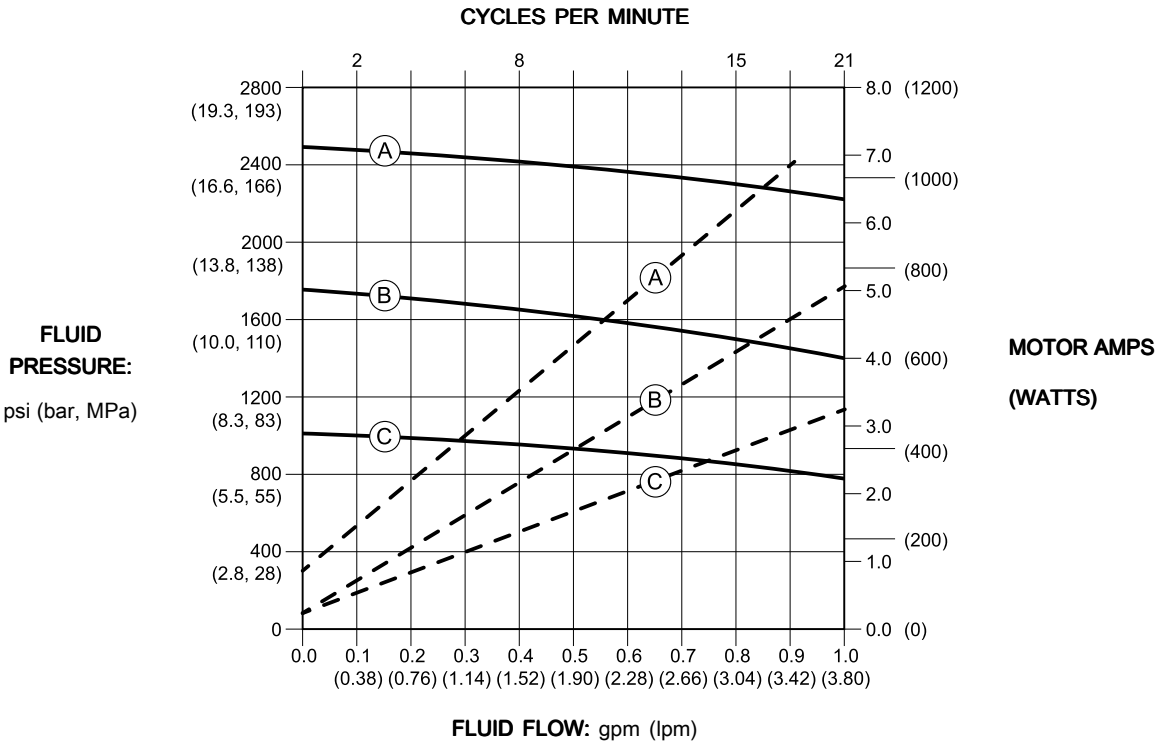


Table 4 . E-Flo DC with Dura-Flo/Xtreme 220 Lower

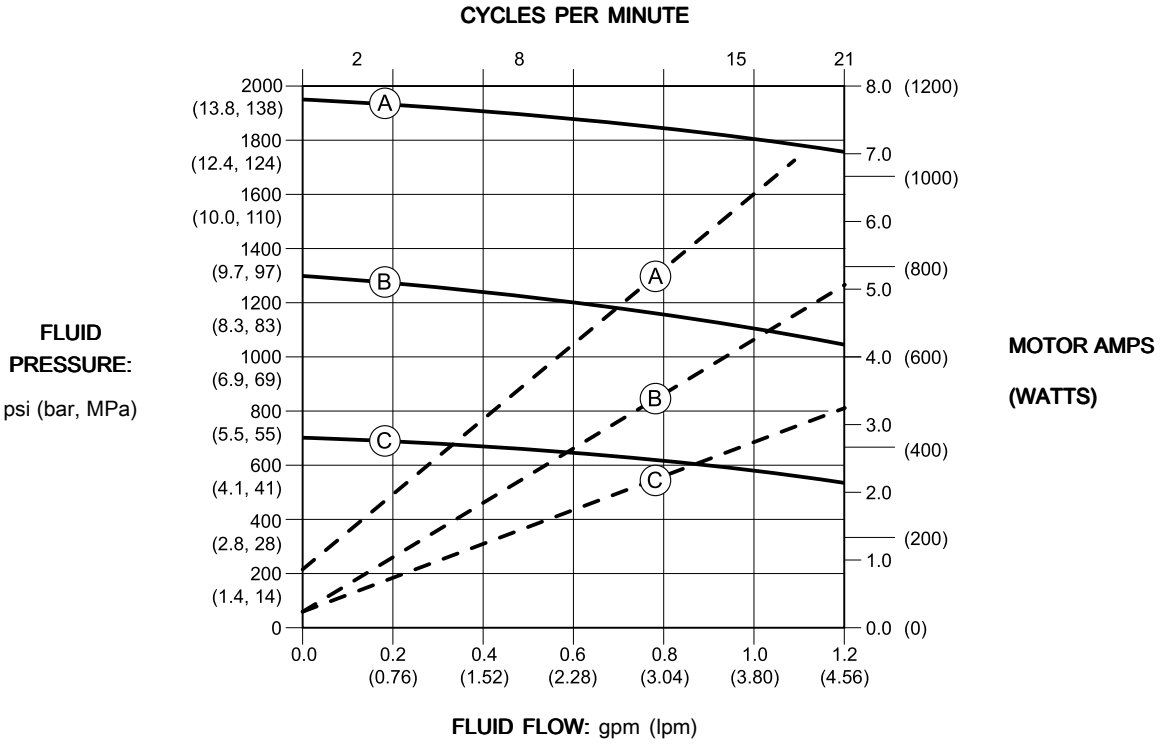
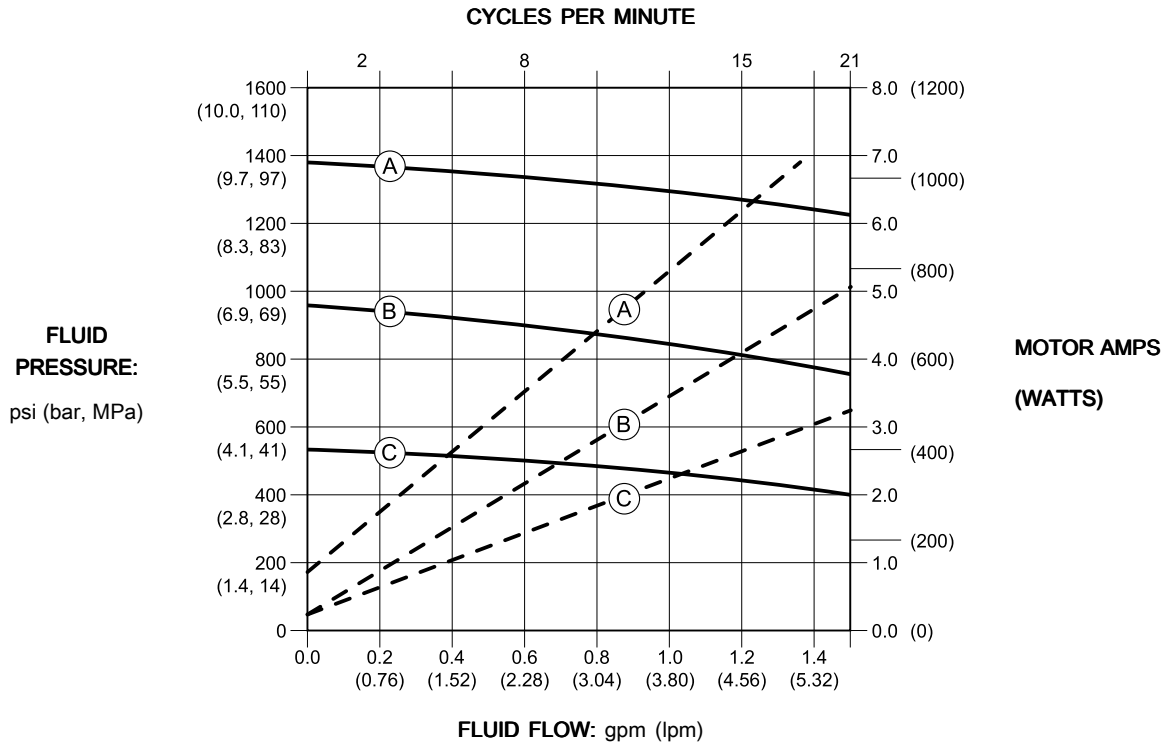


Table 5 . E-Flo DC with Dura-Flo/Xtreme 290 Lower



Technical Data

E-Flo DC Pumps	U.S.	Metric
Maximum fluid working pressure		
Models ES0xxx	1520 psi	10.48 MPa, 104.8 bar
Models ES9xxx	2030 psi	14 MPa, 140 bar
Models ES8xxx	2430 psi	16.75 MPa, 167.5 bar
Models ES7xxx	3040 psi	20.96 MPa, 209.6 bar
Maximum potential fluid pressure	436000/v (volume of lower in cc) = psi	3000/v (volume of lower in cc) = bar
Maximum continuous cycle rate	20 cpm	
Maximum Flow	Maximum flow is determined by the size of the pump lower. See Performance Charts, page 29.	
Input voltage	200–250 Vac, single phase, 50/60 Hz	
Input current	20 A maximum	
Power inlet port size	3/4–14 npt(f)	
Ambient temperature range	32–104°F	0–40°C
Sound data	Less than 70 dB(A)	
Oil capacity	1.5 quarts	1.4 liters
Oil specification	Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil	
Weight	Pump package (motor, 1000cc lower, stand, and tie rods): 220 lb	Pump package (motor, 1000cc lower, stand, and tie rods): 99.8 kg
Fluid inlet size	1–1/2 npt(f)	
Fluid outlet size	3/4 npt(f) [145cc-180cc] 1 npt(f) [220cc-290cc]	
Wetted parts	See Lower Pump manual.	

Notes

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

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To place an order, contact your Graco Distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

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Original Instructions. This manual contains English, MM 333389

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